

SECTION 01782

OPERATION AND MAINTENANCE MANUAL DATA

PART 1 – GENERAL

1.1 SUMMARY

- A. This Section includes requirements for Operation and Maintenance (O&M) manuals for hard copy and electronic/record documents, including the following:
 - 1. Prepare and submit operation and maintenance manuals for building operating systems and equipment.
 - 2. Project record document submittal.
 - 3. Provide O&M data to the Government for use in updating Air Route Traffic Control Center (ARTCC) O&M documents.
- B. Related references for submitting information for operation and maintenance manuals:
 - 1. Appropriate Sections of Divisions 2 through 16 specify special operation and maintenance data requirements for specific pieces of equipment or building operating systems.

1.2 QUALITY ASSURANCE

- A. Maintenance Manual Preparation: In preparation of maintenance manuals, use competent/certified personnel thoroughly trained and experienced in operation and maintenance of equipment or systems involved.
 - 1. Provide O & M manuals prepared in accordance with this Section.
 - 2. Where specifications require written instructions, use personnel skilled in technical writing for communication of essential data.
 - 3. Where specifications require drawings or diagrams, use personnel skilled in preparing drawings clearly in an understandable format.

1.3 SUBMITTAL SCHEDULE

- A. Submittal Schedule: Unless otherwise noted, comply with the following schedule for submitting operation and maintenance manuals:
 - 1. Draft O&M Documentation for Individual Items. Sixty days after approval of each technical submittal, submit 2 draft sets of O&M documentation for the approved item to the COTR for review. All O&M submittals shall be manufacturer's original publications. Photocopies will not be accepted. Manuals shall be organized by system, as described in Paragraph "O&M Manual

- Sections By Building System” of this Section. The COTR will return 1 copy of the draft with comments within 30 days of receipt.
2. Inventory Information. Submit 2 paper copies and one electronic version in MS Excel format 60 days before substantial completion.
 3. Final O&M Documentation. Make corrections or modifications to comply with the COTR’s comments. Submit three sets of the final O&M documentation to the COTR within 15 days of receipt of the COTR’s comments.
- B. Form of Submittal: Prepare operation and maintenance manuals in the form of an instructional manual for use by the Government's operating personnel. Organize into sets in sizes as indicated. Organize O&M information by system as described in paragraph 1.4.
1. Binders: For each manual, provide heavy-duty, commercial-quality, 3-ring, vinyl-covered, loose-leaf binders, maximum of 3 inches thick, sized to receive 8-1/2-by-11- inch paper. Provide a clear plastic sleeve on the spine and front cover to hold labels describing contents. Provide 3-hole punched, heavy-duty sheet protectors to hold folded oversized documents. Do not fill binders to more than 1/2 capacity.
 - a) Where multiple binders are necessary to accommodate data, correlate data in each binder into related groupings according to the Project Manual table of contents. Cross-reference other binders where necessary to provide essential information for proper operation or maintenance of the piece of equipment or system.
 - b) Identify each binder on front and spine, with the printed title "OPERATION AND MAINTENANCE MANUAL," Project title or name, and subject matter covered. Indicate volume number for multiple volume sets of manuals.
 2. Dividers: Provide heavy paper dividers with clear celluloid-covered tabs for each separate Section. Mark each tab to indicate contents. Provide a description of the product and major parts of equipment included in the Section on each divider.
 3. Text Material: Provide the manufacturer's standard printed material. If manufacturer's standard printed material is not available, provide specially prepared data, computer generated, on 8-1/2-by-11 inch, 20-lb/sq. ft. white bond paper.
 4. Drawings: Provide reinforced, punched binder tabs on drawings and bind with text. Where oversize drawings are necessary, fold drawings to the same size as text pages, and inserted in a 3-hole-punched, heavy-duty plastic sheet protector.
- C. Submit 2 copies of each manual, in final form, on equipment and systems to the COTR for distribution. Include information for each unit of equipment, each operating system, and each electric and electronic system.

1.4 MANUAL CONTENT

- A. Include information required by the individual Specification Sections in the form of Data Packages. Data packages shall be developed for each building component, piece of equipment and system based on level of complexity and as specified in the individual Specification Sections. Data packages shall be provided in accordance with Schedule at end of Part 3 of this Section. Applicability of data packages is as follows:
 - 1. Data Package 1: General building materials and components such as sealants, wall and ceiling finishes, door hardware, toilet partitions, wheelchair lift, etc.
 - 2. Data Package 2: HVAC items, piping, plumbing and associated items.
 - 3. Data Package 3: Electrical items, panelboards, light fixtures, receptacles and associated items.
- B. Software: Specified program listings, interface control documents, source code listing, and copies of the operating programs on media appropriate to use as backup for the system software. Include instructions for loading the operating software onto the system.
- C. Additional requirements:
 - 1. For each system, general system or equipment description. Include size, weight, power consumption, power requirements, and outline drawings.
 - 2. Copies of applicable Shop Drawings, Product Data, Drawings, and Schematics for the equipment systems.
 - 3. Theory of Operation: Description of technical operating characteristics of the system and individual equipment using standard phraseology; descriptions of interface requirements including operating protocols; equipment displays and screens; make reference to installation drawings, schematics and equipment displays as required for technical understanding.
- D. Identification Legends:
 - 1. Piping and equipment: Provide a computer-generated legend to correspond with identification devices installed on piping and equipment. List the identifying device, its location, a brief description of the devices function, and the I.D. number.
 - 2. Panel boards and switchboards: Provide a computer-generated legend for each panel board and switchboard installed in the project. This information shall be a duplicate of the legend placed in the panel board.
 - 3. Valve Tags and Schedule: Provide a computer-generated schedule of all valve tags. Include valve type, manufacturer, equipment location and size for all newly installed valves.

- E. Organize the manual into separate Sections, by system as described in Paragraph "O&M Manual Sections by Building System" of this Article, for each system or piece of related equipment.
1. Title Page: Provide a title page in a transparent, plastic envelope as the first sheet of each manual. Provide the following information:
 - a) Subject matter covered by the manual
 - b) Name and address of the Project
 - c) Date of submittal
 - d) Name, address, and telephone number of the Contractor
 - e) Name and address of the Architect
 - f) Cross-reference to related systems in other operation and maintenance manuals.
 - g) Name, address and telephone number of all sub-contractors.
 2. Table of Contents: After the title page, include a computer-generated table of contents for each volume, arranged systematically according to the Project Manual format. Include a list of each product incorporated, identified by product name and other appropriate identifying symbol and indexed to the content of the volume. Each Data Package shall be tabbed and separately listed in the Table of Contents. Where multiple volumes are required to accommodate data, provide a comprehensive table of contents for all volumes in each volume of the set.
 3. General Information: Provide a general information Section immediately following table of contents, listing each product included in the manual, identified by product name. Under each product, list the name, address, and telephone number of the subcontractor or installer and the maintenance contractor where applicable. Clearly delineate the extent of responsibility of each of these entities. Include a local source for replacement parts and equipment.
 4. Product Data: Where the manuals include manufacturer's standard printed data, include only sheets that are pertinent to the part or product installed. Mark each sheet to identify each part or product included in the installation. Where the Project includes more than one item in a tabular format, identify each item, using appropriate references from the Contract Documents. Identify data that is applicable to the installation, and delete references to information that is not applicable.
 5. Written Text: Prepare written text to provide necessary information where manufacturer's standard printed data are not available, and the information is necessary for proper operation and maintenance of equipment or systems. Prepare written text where it is necessary to provide additional information or to supplement data included in the manual. Organize text in a consistent format under separate headings for different procedures. Where necessary, provide a logical sequence of instruction for each operation or maintenance procedure.
 6. Drawings: Provide specially prepared drawings where necessary to supplement manufacturer's printed data to illustrate the relationship of component parts of equipment or systems or to provide control or flow diagrams. Coordinate these

- drawings with information contained in project record drawings to ensure correct illustration of the completed installation.
7. Warranties, Bonds, and Service Contracts: Provide a copy of each warranty, bond, or service contract tabbed in a separate binder. Provide written data outlining procedures to follow in the event of product failure. List circumstances and conditions that would affect the validity of a warranty or bond.

PART 2 – PRODUCTS

NOT USED

PART 3 – EXECUTION

NOT USED

PART 4 – QUALITY ASSURANCE

NOT USED

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